

**Amendments to the Claims**

The claims have been amended as follows.

Claim 1 (previously presented): A wireless sensor system, comprising:

a reader apparatus configured to generate an induction field;

a sensor apparatus configured to monitor structural integrity of an object, the sensor apparatus being communicatively linked to the reader apparatus and in a passive state until energized by the reader apparatus, the sensor apparatus including:

processing circuitry;

a resonant antenna configured to communicate data between the sensor apparatus and the reader apparatus, the resonant antenna being configured to collect energy from the induction field to energize the sensor apparatus;

a plurality of sensors, the sensors being respectively configured to measure predetermined parameters of the object, and to be independently interrogated by the reader apparatus, measurements obtained by the individual sensors being transmitted via a response signal to the reader apparatus via the resonant antenna, the response signal being superimposed on the return induction field;

circuitry configured to store energy collected from the induction field to provide power to the sensor apparatus, including two capacitor banks, one of the capacitor banks being configured to provide power for short-term operations and the other of the capacitor banks being configured to provide power for extended operations, and being configured to accumulate energy while measurements are being made by the plurality of sensors; and

the reader apparatus including:

a transceiver configured to communicate with the sensor apparatus;

an antenna having a loop with a diameter above 66 inches, the loop being formed of multi-strand wires;

a modem configured to selectively transfer data from the reader apparatus to a remote site;

a microprocessor configured to control operations of the reader apparatus, and the individual sensors of the sensor apparatus being independently interrogated by the microprocessor, in operation.

Claim 2 (original): The system of claim 1, wherein the reader apparatus is stationary.

Claim 3 (original): The system of claim 1, wherein the reader apparatus is mobile.

Claim 4 (previously presented): The system of claim 1, wherein upon storing predetermined energy in the energy storing circuitry, the processing circuitry of the sensor apparatus is configured to activate the sensor apparatus from a sleep state to an active state to perform a series of preprogrammed measurement steps to determine the structural integrity of the object, and wherein the antenna of the reader apparatus is configured to be tuned in order to match the resonant frequency of the antenna with a frequency of the object embedding the sensor apparatus.

Claim 5 (original): The system of claim 4, wherein upon activation, individual ones of the sensors are polled to provide a response to the reader apparatus with measurement data obtained by the respective individual sensors.

Claim 6 (original): The system of claim 4, wherein the sensor apparatus reverts back to the sleep state upon transmitting data obtained during the measurement steps.

Claim 7 (previously presented): The system of claim 6, wherein upon reverting back to the sleep state, the energy storing circuitry of the sensor apparatus is configured to accumulate energy to perform a subsequent cycle of measurements.

Claim 8 (original): The system of claim 1, wherein the sensor apparatus communicates via short range telemetry in the frequency range of about 125 kHz to 134 kHz..

Claim 9 (previously presented): The system of claim 1, wherein the energy storing circuitry comprises [[a]] at least two capacitor banks, the capacitor banks including the capacitors.

Claim 10 (cancelled).

Claim 11 (previously presented): A wireless sensor system, comprising:  
a passive sensor apparatus configured to be embedded within a concrete structure to monitor infiltration of contaminants into the structure, the sensor apparatus including energy storing circuitry having two capacitor banks, one of the capacitor banks being configured to provide power for short-

term operations and the other of the capacitor banks being configured to provide power for extended operations, and the sensor apparatus further including a plurality of sensors respectively configured to measure environmental parameters of the structure including information related to the infiltration of contaminants into the structure; and

a reader apparatus communicatively coupled to the sensor apparatus, the reader apparatus being configured to provide power to the energy storing circuitry during communications with the sensor apparatus, the reader apparatus being configured to independently interrogate individual ones of the sensors to obtain information measured by the individual sensors, and the reader apparatus being configured to generate an induction field to energize the sensor apparatus, and information measured by the sensor apparatus is transmitted to the reader apparatus via a response signal.

Claim 12 (previously presented): The system of claim 11, the sensor apparatus comprising:  
processing circuitry; and

a resonant antenna having tuning circuitry configured to communicate data between the sensor apparatus and the reader apparatus, the energy storing circuitry being configured to store energy generated by the induction field, and the sensor apparatus being configured to be in an inactive state until energized by the induction field of the reader apparatus, and data obtained by the individual sensors being transmitted in the return induction field to the reader apparatus via the resonant antenna.

Claim 13 (original): The system of claim 12, the reader apparatus comprising:

a transceiver configured to communicate with the sensor apparatus;

an antenna having an induction loop;

a communications interface configured to communicate information from a remote user to the reader apparatus; and

a microprocessor configured to control operations of the reader apparatus, wherein the reader is configured as a user-interface to the sensor apparatus.

Claim 14 (previously presented): The system of claim 12, wherein the antenna of the reader apparatus is configured to be tuned in order to match the resonant frequency of the antenna with a frequency of the object embedding the sensor apparatus.

Claim 15 (previously presented): The system of claim 11, wherein the processing circuitry is configured to control operations of the plurality of capacitor banks.

Claim 16 (previously presented): The system of claim 14, wherein upon storing predetermined energy in the energy storing circuitry, the processing circuitry is configured to switch the sensor apparatus from the inactive state to an active state to perform a series of preprogrammed measurement steps to determine structural integrity of the concrete structure.

Claim 17 (original): The system of claim 16, wherein the sensor apparatus is configured to revert to the inactive state upon transmitting data that is obtained during the measurement steps to the reader apparatus.

Claim 18 (previously presented): The system of claim 17, wherein upon reverting back to the inactive state, the energy storing circuitry of the sensor apparatus is configured to accumulate energy for a subsequent cycle of operation of the sensor apparatus.

Claim 19 (previously presented): The system of claim 17, wherein the energy storing circuitry of the sensor apparatus is configured to accumulate energy at least while measurements are made by the sensors.

Claim 20 (original): The system of claim 11, wherein the sensor apparatus communicates with the reader apparatus via short range telemetry in the frequency range of about 125 kHz to 134 kHz.

Claim 21 (original): The system of claim 11, wherein upon activation by the reader apparatus, the sensor apparatus is configured to poll the sensors and provide a response to the reader apparatus with information measured by the sensors via the response signal.

Claim 22 (cancelled).

Claim 23 (cancelled).

Claim 24 (cancelled).

Claim 25 (cancelled).

Claim 26 (cancelled).

Claim 27 (cancelled).

Claim 28 (cancelled).

Claim 29 (cancelled).

Claim 30 (cancelled).

Claim 31 (cancelled).

Claim 32 (cancelled).

Claim 33 (cancelled).

Claim 34 (cancelled).

Claim 35 (cancelled).